UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

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Ex parte FRANCIS GABRIEL CELII, MAHESH THAKRE
and SCOTT R. SUMMERFELT

_____

Appeal No. 2006-2209
Application No. 10/270,913

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ON BRIEF

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Before KIMLIN, KRATZ and JEFFREY T. SMITH, Administrative Patent Judges.

JEFFREY T. SMITH, Administrative Patent Judge.

DECISION ON APPEAL

Appellants appeal the Examiner's final rejection of claims 1 to 5, 7 to 14 and 16 to 25. We have jurisdiction under 35 U.S.C. § 134.[1]

[1]In rendering this decision we have considered the Appellants' position as set forth in the Briefs filed November 14, 2005 and March 30, 2006. We have also considered the Examiner's position presented in the Answer mailed January 27, 2006 and the Final Rejection mailed June 2, 2005.

CITATION OF REFERENCES

The Examiner relies on the following references in rejecting the claims on appeal:

Van Buskirk et al. (Van Buskirk)	6,254,792	Jul. 3, 2001
Ko et al. (Ko)	6,770,567	Aug. 3, 2004
Ying et al. (Ying '494)	2003/0022494 A1	Jan. 30, 2003
Ying et al. (Ying '073)	2003/0176073 A1	Sep. 18, 2003

The Examiner entered the following rejections:

(I) Claims 1, 2, 4 to 9, and 11 to 15 stand rejected under 35 U.S.C. § 103(a) as obvious over Ko and Ying '494.

(II) Claims 3 and 25 stand rejected under 35 U.S.C. § 103(a) as obvious over Ko, Ying '494 and Ying '073.

(III) Claims 1 to 5, 7 to 9, 11 to 14, 17 to 22, 24 and 25 stand rejected under 35 U.S.C. § 103(a) as obvious over Ying '073 and Ying '494.

(IV) Claims 10 and 23 stand rejected under 35 U.S.C. § 103(a) as obvious over Ying '494, Ying '703 and Van Buskirk.

Appellants' invention relates to a method of etching a bottom electrode layer in a ferroelectric capacitor stack. The method comprises forming a mask over the ferroelectric capacitor stack, etching the capacitor stack to expose the bottom electrode layer and plasma etching the bottom electrode

layer. Representative claim 1, as presented in the Brief, appears below:

> 1. A method of etching a bottom electrode layer in a ferroelectric capacitor stack, comprising:
>
> forming a hard mask over the ferroelectric capacitor stack;
>
> etching the capacitor stack to expose the bottom electrode layer;
>
> plasma etching the bottom electrode layer at a low bias of less than 150 W with an atmosphere comprising a halogen compound and an oxygen source containing carbon.

Upon careful consideration of Appellants' position and the position set forth by the Examiner, we are in complete agreement with the Examiner's well supported position. Accordingly we affirm all of the Examiner's rejections for the reasons set forth in the Answer and add the following primarily for emphasis.

Appellants have not challenged the Examiner's motivation for combining Ko and Ying '494 together to reject the claimed subject matter. Rather, Appellants argue that the combination would not produce the claimed invention (Brief, p. 4). In further support of this argument, Appellants assert that Ying '494 does not teach a plasma etch at a bias of less than 150 W as claimed. (Brief, p. 4). Appellants further argue that Ying

'494 teaches the desirability of higher etch rate which suggests increasing the bias. (Brief, p. 5).

Appellants' arguments are not persuasive. Ying '494 discloses plasma etching wherein the power supply can be as low as 150 watts. Ying '494 further discloses the effects of power in the etching process. More particularly the higher source and bias powers lead to enhanced etch rates. (Paragraph [0051]). As such, a person of ordinary skill in the art would have reasonably expected that plasma etching would occur at a low bias of 150 watts. In cases involving adjacent ranges, we and our reviewing Court have consistently held that a prima facie case of obviousness exists when the claimed range and the prior art range do not overlap but are close enough such that one skilled in the art would have expected them to have the same properties. Titanium Metals Corp. of Am. v. Banner, 778 F.2d 775, 783, 227 USPQ 773, 779 (Fed. Cir. 1985). Consequently, we conclude that a prima facie case of obviousness has been made out in this case.

Appellants argue that even if the bias may be considered to be a result-effective variable the present invention is not obvious because the prior art teaches increasing the bias.

(Brief, p. 6). Appellants further argue that the prior art teaches away from the claimed invention by encouraging the use of higher bias. (Brief, p. 7).

Appellants' arguments are unpersuasive. A reference is available for all that it teaches to a person of ordinary skill in the art. In re Inland Steel Co., 256 F.3d 1354, 1356, 60 USPQ2d 1396, 1401-02 (Fed. Cir. 2001); Merck & Co. v. Biocraft Labs., Inc., 874 F.2d 804, 807, 10 USPQ2d 1843, 1846 (Fed. Cir. 1989)("[t]he facts that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered" quoting In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976)). Ying '494 discloses that plasma etching can take place at a low bias of 150 watts. Consequently, a person of ordinary skill in the art would have reasonably expected that plasma etching would occur at a bias slightly below 150 watts.

Appellants' arguments presented in the Reply Brief have been fully considered. These arguments are unpersuasive for the reasons set forth above and stated in the Answer.

Claims 1 to 5, 7 to 9, 11 to 14, 17 to 22, and 24-25 stand rejected under 35 U.S.C. § 103(a) as being obvious over the combined teachings of Ying '494 and Ying '073. We affirm.

Appellants argue that the cited prior art does not teach the claimed bias range and does not provide motivation to modify the teachings of the references to meet the present invention.

Appellants' arguments are not persuasive. Appellants do not dispute the Examiner's reliance on the Ying '073 reference for teaching a method of forming a ferroelectric capacitor that differs from the claimed invention in the etching of the bottom layer. As in the above discussed rejection, the Examiner relies on Ying '494 for describing plasma etching using a low bias. Appellants rely on the arguments discussed above regarding the claimed bias of less than 150 watts. (Brief, page 8). As such, Appellants' arguments have been addressed above and in the Answer.

Thus, for the reasons set forth above and in the Answer we affirm the Examiner's rejection.

Claims 3 and 25 stand rejected under 35 U.S.C. § 103(a) as obvious over Ko, Ying '494 and Ying '073. We affirm.

Appellants argue that the cited references do not teach the claimed atmosphere in which the bottom electrode layer is etched (Brief, p. 8). The Examiner asserts that Ying '073 teaches the claimed atmosphere (Answer, p. 8). Appellants have not refuted the Examiner's position that the claimed atmosphere would have been obvious over the teachings of Ying '073 in the responsive Brief. As such for the reasons stated by the Examiner we affirm the rejection.

Claims 10 and 23 stand rejected under 35 U.S.C. § 103(a) as obvious over the combined teachings of Ko, Ying '494, Ying '073 and Van Buskirk. These claims have also been separately rejected over the combined teachings of Ying '494, Ying '073 and Van Buskirk. For each of these above stated rejections, the Appellants rely upon the arguments previously presented regarding claims 1 and 11 (Brief, p. 9). Appellants further argue that Van Buskirk does not remedy the deficiencies of the above cited reference. The Examiner presented factual determinations regarding the suitability of adding the teachings of Van Buskirk to the above cited prior art references. These determinations are reasonable. Since Appellants have failed to specifically challenge the Examiner's

factual determinations, we presumed that they are in agreement with the Examiner. Thus for the reasons presented above regarding claims 1 and 11 and the reasons set forth by the Examiner we uphold these rejections.

CONCLUSION

For the foregoing reasons and those set forth in the answer, based on the totality of the record before us, having evaluated the prima facie case of obviousness in view of Appellants' arguments, we conclude that the preponderance of evidence weighs in favor of obviousness of the claimed subject matter within the meaning of 35 U.S.C. § 103. See In re Oetiker, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed. Cir. 1992).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

EDWARD C. KIMLIN Administrative Patent Judge	)	
PETER F. KRATZ Administrative Patent Judge	)	BOARD OF PATENT APPEALS AND INTERFERENCES
JEFFREY T. SMITH Administrative Patent Judge	)	

JTS/hh

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